

Primary Tuberculous Pyomyositis of the Left Forearm Muscles

Ali Mert¹ , Selda Aydın¹ , Abdurrahman Kaya² 

¹ Department of Infectious Diseases and Clinical Microbiology, İstanbul Medipol University School of Medicine, İstanbul, Türkiye

² Department of Infectious Diseases, İstanbul Training and Research Hospital, İstanbul, Türkiye

ABSTRACT

Pyomyositis, often caused by *Staphylococcus aureus*, is a rare primary infection of skeletal muscle and is usually associated with abscess formation. Pyomyositis caused by *Mycobacterium tuberculosis* is extremely rare. In this paper, by presenting a case of tuberculous pyomyositis, we tried to provide a simple answer to the question of when we should consider *M. tuberculosis* in the etiology of pyomyositis.

Keywords: tuberculosis, pyomyositis, forearm

INTRODUCTION

Pyomyositis is a primary infection of skeletal muscle that does not result from a contiguous disease, is hematogenous in origin, and often results in abscess formation. Although pyomyositis is classically an infection in tropical regions, it is an emerging infection in temperate climates. Pyomyositis is frequently caused by aerobic Gram-positive and Gram-negative bacteria (1). *Staphylococcus aureus* (~90% in tropical regions and 75% in temperate regions) is the most commonly isolated bacterium. Pyomyositis caused by *Mycobacterium tuberculosis* is extremely rare. Here, we report a patient with tuberculous (TB) pyomyositis.

CASE

A 51-year-old male patient applied with a year history of painless, progressively increasing swelling volar face of the left forearm. There was no history of fever, weight loss, anorexia, trauma, diabetes, immunosuppression, corticosteroid use, and renal failure. His

Corresponding Author:
Abdurrahman Kaya

E-mail:
dr.abdkaya@hotmail.com

Received: April 24, 2024
Accepted: June 27, 2024
Published: September 26, 2024

Suggested citation:
Mert A, Aydın S, Kaya A. Primary tuberculous pyomyositis of the left forearm muscles. Infect Dis Clin Microbiol. 2024;3:248-51.

DOI: 10.36519/idcm.2024.360





Figure 1. Macroscopic appearance of the swelling.

history was negative for recent TB or contact. Physical examination showed significant swelling of the left forearm without erythema, tenderness, or warmth to palpation (Figure 1). There were two BCG scars, and QuantiFERON®-TB Gold Plus was 2.67 IU/mL (0 - 0.35 IU/mL). All laboratory tests, such as C-reactive protein (CRP), erythrocyte sedimentation rate, biochemistry and hemogram, were within normal limits. Radiographs of the chest revealed no evidence of pulmonary TB. The HIV antibody test was negative. Ultrasonography revealed a thick-walled, dense collection approximately 100 mm in length and 21 mm in depth between the muscle planes on the volar face of the left forearm (Figure 2).

The intramuscular abscess containing a large amount of fibrinous pus collection was drained and was positive for acid-fast bacilli (AFB) by Ehrlich-Ziehl-Neelsen (EZN) staining. The sample was positive for *M. tuberculosis* complex DNA, which was tested using the GeneXpert® MTB/RIF Ultra system (Cepheid, USA). *M. tuberculosis* complex was grown from pus two weeks later using the BD BACTEC™ MGIT™ automated mycobacterial detection system (liquid media) (Becton Dickinson, USA). Histopathology of muscle showed CD68⁺ cells (histiocytes) around necrosis, chronic inflammation and granulomatous reaction consistent with TB pyomyositis. AFB was not seen on EZN staining of the granulomatous tissue. The diagnosis of TB pyomyositis was made, and the patient was successfully treated with the traditional regimen (intensive phase: 2 months and maintenance phase:

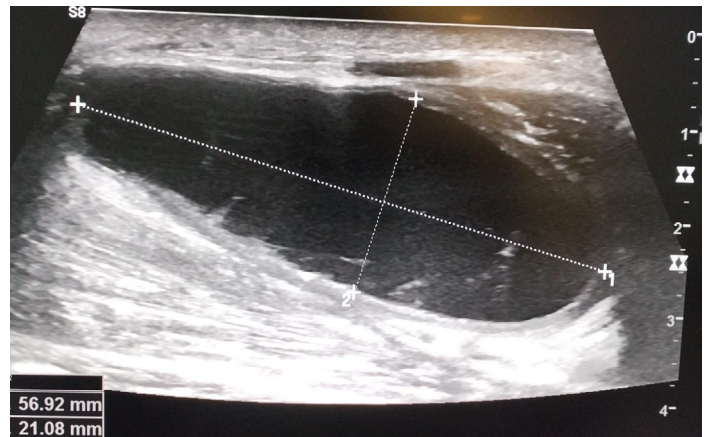


Figure 2. Ultrasound examination showing pus collection in the muscle.

4 months), including the drugs isoniazid, rifampin, pyrazinamide and ethambutol.

DISCUSSION

TB remains a major public problem. Musculoskeletal TB occurs in ~10% of patients with extrapulmonary tuberculosis (2), while TB pyomyositis is extremely rare. Case reports of TB pyomyositis are very limited in the literature but are gradually increasing due to the widespread use of immunosuppressive drugs and the HIV/AIDS pandemic. In daily practice, *M. tuberculosis* is not considered in the etiology of primary muscle abscesses. Pyogenic pyomyositis and TB pyomyositis cannot be distinguished on the basis of clinical and radiological findings.

Most TB pyomyositis cases reported in the literature were treated empirically with antibiotics following a preliminary diagnosis of pyogenic pyomyositis (3-14). Radiographic imaging, such as ultrasonography, computed tomography, and magnetic resonance imaging (MRI), are the most helpful tools in the diagnosis of pyomyositis. MRI is the optimal imaging technique and is highly sensitive to muscle inflammation, even before the formation of a frank abscess. The definitive etiological diagnosis of pyomyositis is made by microbiological and pathological examination of the appropriate sample (pus or tissue). It is made by the isolation of *M. tuberculosis* in the pus or tissue sample or by histopathological evidence of TB in any relevant

Table 1. Main characteristics of the cases.

No of reference	Age	Gender	Organ involvement	AFB	Culture	Pathology	PCR	Underlying condition	Immuno-suppression	Other focus
Ref. 3	69	F	Right thigh	Positive	Positive	Negative	—	Renal transplant	Present	—
Ref. 4	49	M	Left leg and gluteal muscles	Negative	Positive	Positive	—	—	Absent	—
Ref. 5	29	F	Left temporal muscles	Negative	Positive	—	—	—	Absent	—
Ref. 6	20	M	Antebrachial muscles	Positive	Positive	Positive	—	—	Absent	—
Ref. 7	23	M	Right forearm	Positive	—	—	—	—	Absent	—
Ref. 8	23	F	Left forearm	Negative	Negative	Positive	Positive	—	Absent	—
Ref. 8	38	F	Left forearm	Negative	Negative	Positive	Positive	—	Absent	—
Ref. 9	55	F	Right thigh	Positive	Positive	—	—	Rheumatoid arthritis	Present	—
Ref. 10	66	F	Right thigh	Positive	Positive	Positive	—	DM, polymyalgia rheumatica	Present	—
Ref. 11	53	F	Left scapula and biceps	Positive	—	—	Positive	Sarcoidosis and pulmonary fibrosis	Present	Pulmonary TB
Ref. 12	45	M	Quadriceps Femoris	Positive	—	Positive	Positive	—	Absent	—
Ref. 13	85	M	Left thigh	Positive	Positive	—	Positive	Rheumatoid arthritis	Present	Pulmonary TB
Ref. 14	33	F	Right leg and gastrocnemius	Positive	Positive	Positive	—	Systemic lupus erythematosus	Present	—
Our case	51	F	Left forearm	Positive	Positive	Positive	Positive	—	Absent	—

AFB: Acid-fast bacilli, TB: Tuberculous.

tissue sample. Gram and EZN staining of pus, as well as TB-PCR study results, are available within two hours. The bacteriological diagnosis of pyomyositis is traditionally made from cultures of surgical specimens. Pus or tissue culture using a Lowenstein-Jensen medium and mycobacteria growth indicator tube (MGIT) detection system is the gold standard for TB diagnosis.

AFB, PCR, and culture positivity rates were 92%, 100%, and 82%, respectively, in 13 cases with TB pyomyositis that we reviewed from the literature (3-14). The characteristics of all patients, including our report, are shown in Table 1. Although no TB focus was detected in our case, pulmonary TB had been

diagnosed by TB culture and PCR in two patients. In addition, immunosuppression was present in almost half of the patients. In our case, all tests, including AFB, PCR, culture and histopathology, were performed and were all positive. Smear microscopy by EZN to detect AFB remains the mainstay of TB diagnosis. However, it is difficult to detect less than 10,000 bacilli per mL with this method (15).

In conclusion, in all cases of TB pyomyositis with abscess, *M. tuberculosis* should be investigated in addition to Gram staining and aerobic culture on the first pus sample. Thus, the diagnosis can be made without delay, resulting in good functional recovery with adequate drainage and anti-TB treatment.

Ethical Approval: N.A.

Informed Consent: Informed consent was obtained from the patient.

Peer-review: Externally peer-reviewed

Author Contributions: Concept – A.M., A.K.; Design – A.M., A.K.; Supervision – A.M., S.A.; Materials – A.M., S.A.; Data Collection

and/or Processing – S.A., A.K.; Analysis and/or Interpretation – S.A., A.K.; Literature Review – A.M., A.K.; Writer – A.M., A.K.; Critical Reviews – A.M., A.K.

Conflict of Interest: The authors declare no conflict of interest.

Financial Disclosure: The authors declared that this study has received no financial support.

REFERENCES

- 1 Stevens DL, Bisno AL, Chambers HF, Dellinger EP, Goldstein EJ, Gorbach SL, et al. Practice guidelines for the diagnosis and management of skin and soft tissue infections: 2014 update by the Infectious Diseases Society of America. *Clin Infect Dis*. 2014;59(2):147-59. [[CrossRef](#)]
- 2 Rieder HL, Snider DE Jr, Cauthen GM. Extrapulmonary tuberculosis in the United States. *Am Rev Respir Dis*. 1990;141(2):347-51. [[CrossRef](#)]
- 3 Johnson DW, Herzig KA. Isolated tuberculous pyomyositis in a renal transplant patient. *Nephrol Dial Transplant*. 2000;15(5):743. [[CrossRef](#)]
- 4 Ergin F, Arslan H, Bilezikçi B, Ağildere AM, Ozdemir N. Primary tuberculosis in the gluteal muscle of a patient with chronic renal failure. A rare presentation. *Nephron*. 2001;89(4):463-6. [[CrossRef](#)]
- 5 Chu CK, Yang TL, Tan CT. Tuberculous pyomyositis of the temporal muscle in a nonimmunocompromised woman: diagnosis by sonography. *J Laryngol Otol*. 2004;118(1):59-61. [[CrossRef](#)]
- 6 Baylan O, Demiralp B, Cicek EI, Albay A, Komurcu M, Kisa O, et al. A case of tuberculous pyomyositis that caused a recurrent soft tissue lesion localized at the forearm. *Jpn J Infect Dis*. 2005;58(6):376-9.
- 7 Narang S. Tuberculous pyomyositis of forearm muscles. *Hand (N Y)*. 2009;4(1):88-91. [[CrossRef](#)]
- 8 Sen RK, Tripathy SK, Dhath S, Saini R, Aggarwal S, Agarwal A. Primary tuberculous pyomyositis of forearm muscles. *Indian J Tuberc*. 2010;57(1):34-40.
- 9 Khosla P, Aroaa N, Jain S. Tubercular pyomyositis in a case of rheumatoid arthritis being treated with infliximab. *Int J Rheum Dis*. 2010;13(1):82-5. [[CrossRef](#)]
- 10 Simon SP, Fodor D, Valasciuc R, Tamas MM, Rednic S. A rare case of primary tuberculous pyomyositis. Case report. *Med Ultrason*. 2011;13(3):245-8.
- 11 Krishnasamy V, Joseph M. Tuberculous pyomyositis: a rare but serious diagnosis. *Case Rep Med*. 2013;2013:126952. [[CrossRef](#)]
- 12 Modi MA, Mate AD, Nasta AM, Gvalani AK. Primary tuberculous pyomyositis of quadriceps femoris in an immunocompetent individual. *Case Rep Infect Dis*. 2013;2013:723879. [[CrossRef](#)]
- 13 Migkos MP, Somarakis GA, Markatseli TE, Matthaiou M, Kosta P, Voulgari PV, et al. Tuberculous pyomyositis in a rheumatoid arthritis patient treated with anakinra. *Clin Exp Rheumatol*. 2015;33(5):734-6.
- 14 Al-Khazraji A, Takher J, Alkhawam H, Fabbri M. Primary tuberculous pyomyositis of the calf muscles. *Am J Med Sci*. 2017;353(2):187-8. [[CrossRef](#)]
- 15 Hobby GL, Holman AP, Iseman MD, Jones JM. Enumeration of tubercle bacilli in sputum of patients with pulmonary tuberculosis. *Antimicrob Agents Chemother*. 1973;4(2):94-104. [[CrossRef](#)]